

App. No. 10/065,992
Amendment dated November 1, 2004
Reply to Office action of July 30, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claim 1 (original): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and
coated over said cemented-carbide base material, a compound thin film made up of a combination of one or more elements selected from the group titanium, chromium, vanadium, silicon and aluminum, and one or more elements selected from carbon and nitrogen; wherein
said compound thin film is coated in at least a single layer.

Claim 2 (original): The surface-coated machining tool set forth in claim 1, wherein said compound thin film is 0.05 μm or more and 3 μm or less in thickness.

Claim 3 (original): The surface-coated machining tool set forth in claim 1, wherein a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said compound thin film.

Claim 4 (original): The surface-coated machining tool set forth in claim 1, wherein said compound thin film is in surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by indication Ra.

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Claim 5 (original): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and
a hard carbon thin film made up essentially of carbon atoms only, coated over said cemented-carbide base material by a physical vapor deposition method in which graphite is made a raw material; wherein said hard carbon thin film is coated in at least a single layer.

Claim 6 (original): The surface-coated machining tool set forth in claim 5, wherein said hard carbon thin film is 0.05 μm or more, and 3 μm or less in thickness.

Claim 7 (original): The surface-coated machining tool set forth in claim 5, wherein a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said hard carbon thin film.

Claim 8 (currently amended): The surface-coated machining tool set forth in claim ~~8~~ claim 5, wherein said hard carbon thin film is in surface roughness adjusted to be 0.01 μm or more and 0.5 μm or less by indication Ra.

Claim 9 (original): The surface-coated machining tool set forth in claim 1, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 10 (original): The surface-coated machining tool set forth in claim 2, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

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Claim 11 (original): The surface-coated machining tool set forth in claim 3, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 12 (original): The surface-coated machining tool set forth in claim 4, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 13 (original): The surface-coated machining tool set forth in claim 5, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 14 (original): The surface-coated machining tool set forth in claim 6, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 15 (original): The surface-coated machining tool set forth in claim 7, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 16 (original): The surface-coated machining tool set forth in claim 8, wherein the tungsten carbide in said cemented-carbide base material is 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size.

Claim 17 (new): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

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coated over said cemented-carbide base material, by a physical vapor deposition method, a compound thin film made up of a combination of one or more elements selected from the group titanium, chromium, vanadium, silicon and aluminum, and one or more elements selected from carbon and nitrogen; wherein

said compound thin film is coated in at least a single layer; and
a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said compound thin film.

Claim 18 (new): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

coated over said cemented-carbide base material, by a physical vapor deposition method, a compound thin film 0.05 μm or more and 3 μm or less in thickness, made up of a combination of one or more elements selected from the group titanium, chromium, vanadium, silicon and aluminum, and one or more elements selected from carbon and nitrogen; wherein

said compound thin film is coated in at least a single layer; and
a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said compound thin film.

Claim 19 (new): A surface-coated machining tool, comprising:
a cemented-carbide base material containing tungsten carbide 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size, and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

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a hard carbon thin film made up essentially of carbon atoms only, coated over said cemented-carbide base material by a physical vapor deposition method in which graphite is made a raw material; wherein said hard carbon thin film is coated in at least a single layer.

Claim 20 (new): A surface-coated machining tool, comprising:

a cemented-carbide base material containing tungsten carbide 0.1 μm or more and 1.5 μm or less in pre-sintering crystal-grain size, and cobalt, with the cobalt inclusion amount being 4 weight % or more and 12 weight % or less; and

a hard carbon thin film made up essentially of carbon atoms only, coated over said cemented-carbide base material by a physical vapor deposition method in which graphite is made a raw material; wherein said hard carbon thin film is coated in at least a single layer; and a compressive residual stress of 0.1 GPa or more and 8 GPa or less is imparted to said hard carbon thin film.